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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,756	01/18/2007	Michael Khazen	0380-P04045US0	1450

110   7590   07/19/2010
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EXAMINER
KIM, CHONG R

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
07/19/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/578,756	KHAZEN ET AL.
Office Action Summary	Examiner	Art Unit	
	CHARLES KIM	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *39-74* is/are pending in the application.

    4a) Of the above claim(s) *50,51,53,67,68 and 70* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *39-43,52,55-60,69 and 72* is/are rejected.

7)☒ Claim(s) *44-49,54, 61-66,71,73 and 74* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Restriction Requirement

Applicant's election without traverse of Group A (claims 44-49, 61-66), in the reply filed

on June 16, 2010 is acknowledged. Claims 50, 51, 53, 67, 68, 70 are withdrawn from further

consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

Claim 55 is objected to under 37 CFR 1.75(c) as being in improper form because a

multiple dependent claim cannot depend on another multiple dependent claim. Here, multiple

dependent claim 55 is dependent on another multiple dependent claim 41. Accordingly, the

claim 55 has not been further treated on the merits. See MPEP § 608.01(n).

A similar objection applies to claim 72.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or
on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 39 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Martel et

al., "The use of PCA to smooth functional MRI images" ("Martel").

Referring to claim 39, Martel discloses a method of processing a time-sequence of separate image data sets which record induced changes in pixel values of successive images of a subject, each set comprising a plurality of image data items which each represent the location of an image pixel of the image subject according to a common reference frame within which the subject is located, the method including the steps of:

(a) selecting from each of a plurality of said separate image data sets an image data item which represents an image pixel located at the same fixed image pixel location, thereby to generate a time-domain image data set containing only image data items which represent an image pixel at the same said image pixel location [*pp. 13-14 and fig. 1. Note the time activity curve (TAC) for each individual pixel is disclosed and illustrated in fig. 1.*] ;

(b) determining according to a measure of said induced changes as between all of the pixel values of the image data items of the time-domain image data set whether the image data items thereof are associated with the presence of a specified tissue within the image subject [*pp. 13-14 and fig. 1. Note that the TACs for the arterial, venous, grey and white matter components are generated.*].

Referring to claim 41, Martel further discloses that the measure is defined according to the dispersion of the values of pixel intensity associated with the image data items within the time-domain image data set [*pp. 13-14 and fig. 1. Note that the TAC curve represents the dispersion of the pixel intensity values over time.*].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

Claims 40, 52, 54, 56-58, 69, and 71 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Martel.

Referring to claims 40 and 52, Martel does not expressly disclose the step of identifying

the image data items as being unsuitable for use in the generation of an image of the subject if

the specified tissue is of a type which is not desired to be included within the image of the

subject. Martel also does not disclose replacing these data items by a value of zero. However,

Official notice is taken that the concept of identifying image data as being unsuitable if it

represents an object which is not desired was exceedingly well known in the art. For instance,

segmentation of image data to exclude regions that are not desired is one well known example of

this concept. Therefore, it would have been obvious to modify Martel to include the steps recited

in claims 40 and 52 to yield the predictable result of including only those portions of the image

data that are relevant, thereby enhancing the diagnosis process.

Referring to claim 54, Martel further discloses repeating the steps described above (claim

39) for each pixel of each of the time-sequence of separate image data sets [*p. 14. Note that the

TACS are obtained for the aterial, venous, grey and white matter regions in the image.*].

Referring to claim 56, see the rejection of at least claim 39 above.[1] As noted above,

Martel discloses each of the functions performed by the image processing means recited in claim

56. However, Martel does not expressly disclose the claimed image processing means and its components. Nonetheless, Official notice is taken that an image processing means (i.e., work station) for analyzing the dynamic image data disclosed by Martel was well known in the art. Therefore, it would have been obvious to modify Martel to include an image processing means to take advantage of the benefits of using a work station computer--ability to perform complex calculations quickly and automatically.

Referring to claim 57, see the rejection of at least claim 40 above.

Referring to claim 58, see the rejection of at least claim 41 above.

Referring to claim 69, see the rejection of at least claim 52 above.

Referring to claim 71, see the rejection of at least claim 54 above.

Claims 42 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Martel and Niemeyer, U.S. Patent Application Publication No. 2005/0074149 ("Niemeyer").

Referring to claim 42, Martel does not disclose determining the presence of the specified tissue within the image subject if the measure (of the changes in pixel values) exceeds a predetermined threshold value. However, this feature was well known in the art. For example, Niemeyer discloses determining the presence of a specified tissue within an image subject if the change in an image value exceeds a predetermined threshold value [*pars. 12-13. Note that different tissue types are determined based on whether the change in image values of the dynamic image data is above a first and second reference value.*].

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[1] Note that 112 6th paragraph has been invoked by the claim's use of "means for."

Martel and Niemeyer are combinable because they are both concerned with dynamic

medical imaging methods. Martel is concerned with determining different anatomical regions in

the image data [*p. 14*]. Niemeyer provides an accurate and efficient way of differentiating tissue

types based on a simple threshold comparison technique. As such, one of ordinary skill and

creativity, starting with Martel, would have looked to Niemeyer to incorporate Niemeyer's

threshold teaching to achieve the predictable and desirable result of determining the presence of

a specified tissue quickly and efficiently. Therefore, it would have been obvious to combine

Martel with Niemeyer to obtain the invention as specified in claim 42.

Referring to claim 59, see the rejection of at least claim 42 above.

Claims 43 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Martel and Nanbu, U.S. Patent Application Publication No. 2009/0080724

("Nanbu")

Referring to claim 43, Martel does not expressly disclose that determining the changes in

pixel values comprises forming a time-domain image vector. However, this feature was well

known in the art. For example, Nanbu discloses determining changes in pixel values of dynamic

medical image data by forming a time-domain image vector wherein each image data item of a

time-domain image data set represents a separate vector component of the time-domain image

vector and determining a measure of changes in pixel values according to a property of the time-

domain image vector [*par. 215. Note that the time-density curve can be represented by a

vector.*].

Martel and Nanbu are combinable because they are both concerned with dynamic medical imaging methods. Martel is concerned with analyzing the changes in pixel values using time activity curves (TAC) [*p. 13*]. Nanbu explains that time activity curves can be interchanged with vectors to produce the same results [*par. 215*]. As such, the combination of Martel and Nanbu amounts to a simple substitution of one well known element (Martel's TAC) with another well known element (Nanbu's vectors) to yield predictable results--expressing the change in pixel values of dynamic medical image data. Therefore, it would have been obvious to combine Martel and Nanbu to obtain the invention as specified in claim 43.

Referring to claim 60, see the rejection of at least claim 43 above.

Allowable Subject Matter

Claims 44-49, 61-66, 73-74 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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July 15, 2010